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## TWO NEW SPECIES OF POLYGALA FROM NORTHERN MEXICO<sup>1</sup>

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In an earlier paper on the cytology of *Polygala* (Lewis & Davis, *Rhodora* 64: 102-113, 1962), reference was made to five collections thought to represent four new species. Using the keys and descriptions of Blake (*N. Am. Fl.* 25: 305-370, 1924), species numbered 3 (*Oliver 136*) and 4 (*Lewis 5728, 5755*) could be placed with *P. alba* Nutt. and the var. *suspecta* Wats. The chromosome number of *P. alba* in Texas was reported as  $n = 12$  whereas those for number 3 from Oaxaca and number 4 from Coahuila and Nuevo Leon were recorded as  $n = \text{ca. } 36$  and  $n = 52-54$ , respectively. Although wide differences in chromosome number are not unknown for a single species, these counts, when considered in conjunction with the known heteromorphism of individuals now included under *P. alba* (Dr. M. C. Johnston, University of Texas, personal communication), strongly suggest that more than one species is involved. Additional cytotaxonomic study should be completed, however, particularly with the Mexican forms in the complex, before the naming and describing of new taxa will be purposeful. Consequently, only those plants represented by numbers 1 and 2 will be presented.

### *Polygala shinnersii* W. H. Lewis, sp. nov.

Caules e radice tenui perenni plures 1.5-2.0 dm. alti. Folia inferiora mediocriusque verticillata spatulato-obovata, suprema alterna linearia. Racemi cylindrici acuminati 6-8 mm. diametro; flores candida purpureo-cristati; sepala lanceo-elliptica 1.0-1.2 mm. longa; alae obovatae 2.9-3.3

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mm. longae. Capsulae ovales 2.6-3.2 mm. longae; semina pilosa 2.4-2.7 mm. longa, arillorum lobae duae linearo-ellipticae 1.6-1.8 mm. altae.

Stems several from slender perennial root, erect, angular, 1.5-2.0 dm. tall; leaves 4-6 in whorls to middle of stem or beyond, usually shorter than the internodes, spatulate-obovate, 6-13 mm. long, 2-3 mm. wide, the upper alternate, linear. cuspidate, 13-21 mm. long, 1.5-2.0 mm. wide, glabrous; peduncles 2.2-4.2 cm. long; racemes dense, cylindrical, acuminate, 6-8 mm. thick; pedicels 0.2-0.3 mm. long; flowers white with purple crests; sepals lance-elliptic, acuminate, 1.0-1.2 mm. long; wings obovate, 2.9-3.3 mm. long, 1.7-2.0 mm. wide; keels 2.7-3.0 mm. long, the crest of 4 lobes on each side; capsules oval, 2.6-3.2 mm. long, 2.2-2.6 mm. wide; seeds cylindrical, pilose, 2.4-2.7 mm. long, 1.2-1.5 mm. wide; arils 1.6-1.8 mm. high, the 2 linear-elliptic lobes appressed; chromosome number  $2n = ca. 84$ .

Holotype: MEXICO: Nuevo Leon: 11 miles E of junction of Highways 57 and 60, *Lewis 5754* (US). Rare in open pine woods, 2 Sept. 1961. Known only from the type locality.

Although keying to the section *Timutua*, *P. shinnersii* is not closely related to other species in the section. In habit it has a striking resemblance to that of *Galium*.

***Polygala vergrandis* W. H. Lewis, sp. nov.**

Caules e radice annua plures puberuli 3-8 cm. longi. Folia alterna linearia. Racemi cylindrici acuminati 2.5-4.0 mm. diametro; flores candida viridi- et purpureo- venosi; sepala lanceo-elliptica 1.0-1.5 mm. longa; alae obovatae 1.8-2.2 mm. longae. Capsulae oblongae 2.5-3.0 mm. longae indehiscentes loculo superiore alato inferiore exalato; semina pilosa 2.0-2.4 mm. longa, arilli 0.6-0.9 mm. alti, lobis duabus appressis (in seminibus e loculo inferiore deficientibus).

Stems several from a long slender annual root, 3-8 cm. long, erect or ascending, slender, densely puberulous; leaves alternate, linear, 4-8 mm. long, 1 mm. wide, acuminate at apex, 1-nerved below, margins somewhat revolute; peduncles 3-6 mm. long; racemes cylindric, acuminate, dense, 2.5-4.0 mm. thick, the axis 10-15 mm. long; bracts lanceolate, deciduous, 1.0-1.3 mm. long; pedicels 0.3-0.5 mm. long; flowers white, green- and purple- veined; sepals lance-elliptic, subacuminate, 1.0-1.5 mm. long; wings obovate, 1.8-2.2 mm. long, 0.6-0.9 mm. wide, obtuse at apex; keels 1.6 mm. long, the crest of 2 lobes on each side; capsules oblong, rounded at both ends, light green, 2.5-3.0 mm. long, 1.2-1.5 mm. wide, the upper cell larger, winged, the lower wingless, indehiscent; seeds cylindrical, curved, pilose, 2.0-2.4 mm. long, 0.5 mm. wide, seeds of lower cell somewhat smaller; arils 0.6-0.9 mm. high, 2 lobes appressed, wanting in seed from lower cell; chromosome number  $2n = 24$ .

Holotype: MEXICO: Nuevo Leon: 9.9 miles E of junction of Highways 57 and 60, *Lewis 5746* (US). Rare on rocky edge of hill, 2 Sept. 1961. Known only from the type locality.

Characteristics of the section *Monninopsis* nearest *P. scoparioides* Chod., but the resemblance to this species is not close. — STEPHEN F. AUSTIN STATE COLLEGE, NACOGDOCHES, TEXAS.

## THE AQUATIC FORM OF *ALISMA SUBCORDATUM* Raf.

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*Alisma subcordatum* is a common species of marsh or aquatic herb of temperate North America and usually grows emersed with ovate or elliptical aerial leaves. In the fall of 1958 a botany class at the University of New Hampshire collected a specimen growing in 1½ feet of water which had narrow-lanceolate floating leaves. Subsequently other plants with floating leaves were collected in the vicinity of Durham, N. H. While a deep water form of the European *Alisma plantago-aquatica* is recognized (Arber 1920, 1925), apparently most authors do not recognize a similar form in the American species. Muenscher (1944), Fassett (1957), Fernald (1950) and Hendricks (1957) do not mention a deep water form, but Pierce (*In* Gleason 1952, vol. 1, p. 88) states that plants growing in relatively deep water or where the water level varies have longer, laxer, ovate-lanceolate to linear leaves.

The following experiments were conducted in the greenhouse to test the response of plants to varying depths of water. Seeds were stratified at 5° C. for 60 days according to the recommendations of Crocker and Barton (1952), and were then germinated in sand under water. On April 1 the seedlings were transplanted to muck soil in battery jars, about 20 seedlings per jar. The water levels were adjusted to 2 cm (10 jars), 12 cm (4 jars) and 25 cm (2 jars). Nothing more was done to the plants except to maintain the water level. By early July, four to six plants in each jar with 2 or 12 cm of water had produced aerial leaves and inflorescences. In addition, the plants grown in 12 cm of water produced floating leaves. Plants grown in 25 cm of water, however, produced only floating leaves.